

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
29 March 2001 (29.03.2001)

PCT

(10) International Publication Number
WO 01/22701 A1

(51) International Patent Classification?: H04M 1/725,
1/66, 11/04

DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU,
ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS,
LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ,
PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT,
TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(21) International Application Number: PCT/GB00/03617

(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG,
CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(22) International Filing Date:
21 September 2000 (21.09.2000)

Published:

- With international search report.
- Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
9922447.9 22 September 1999 (22.09.1999) GB

(71) Applicant and

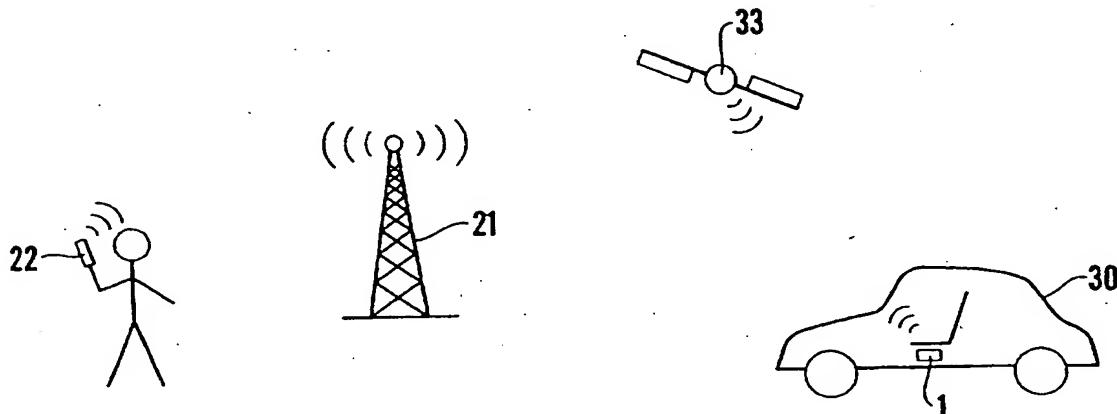
(72) Inventor: CLIFFORD, Roger [GB/GB]; 35 Windsor
Street, Stapleford, Nottingham NG9 7HE (GB).

(74) Agent: JONES, Stephen, Anthony; Adamson Jones, 32a
Stoney Street, Nottingham NG1 1LL (GB).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE,

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: MOBILE TELEPHONE-BASED ALARM DEVICE



WO 01/22701 A1

(57) Abstract: A portable alarm and cellular telephone unit (1) comprises a cellular telephone transmitter/receiver and a sensor adapted to detect an alarm condition. The unit (1) has the appearance of a conventional mobile telephone, comprising a keypad (2) for input of a telephone number, a microphone (5) and a loudspeaker (4), and can be used as a conventional mobile telephone. The sensor is linked to the transmitter/receiver such that upon detection of the alarm condition an alarm call is placed automatically to a predetermined destination telephone number. The sensor may be a movement sensor which is actuated by any movement of the unit (1). When the unit (1) is left, in an armed condition, in for instance a vehicle the alarm call is triggered in the event that the vehicle is moved.

Title – Mobile telephone-based alarm device

This invention relates to a mobile telephone device, and in particular to a mobile telephone device operable manually or automatically as an alarm unit.

5

Many different forms of alarm system are available. These are actuated to provide an indication of unwelcome events such as break-ins into property or vehicles, fire, attacks on persons etc. Alarm systems are available as specialist systems for dwellings, industrial premises, vehicles etc or for personal use. Apart 10 from personal "attack" alarms, most others are hard-wired systems which issue alarm signals audibly and/or visually by means of sirens, visual beacons etc. In dwellings and industrial premises these alarms consist of a central hard-wired control box and several detectors which, when the system is armed, will detect movement. These detectors relay this information to a central control panel 15 which activates the alarm in response, eg by sounding the alarm siren and/or causing warning lights to flash. Vehicle alarm systems operate in a similar fashion.

Systems such as those described above are very inflexible and their use is

20 limited to the building or vehicle in which they are installed. Once activated, they rely on either the intervention of a third party or the owner of the property being close enough to the property to be alerted by the alarm. Many activations of such alarms go unheeded.

25 Portable alarms are also known. Examples include personal attack alarms which are small units intended to be carried, eg in a pocket or handbag. In the event of the carrier being subjected to any form of physical attack the alarm can be manually activated so as to alert other persons in the vicinity and to elicit assistance.

30

Alarm units are also known that, in addition to, or instead of, the simple activation of an alarm such as a flashing light or a siren, transmit alarm information to a remote location. Such a location may be an alarm receiving centre, which in turn

contacts a designated person or persons to alert them to activation of the alarm. Communication between the alarm unit and the alarm receiving centre in such cases may be via a cellular telephone network.

- 5 Other forms of device that utilise mobile telephony technology are so-called tracker systems installed in vehicles. Such devices transmit positional information to a remote alarm receiving centre. Typically, if the owner of a vehicle discovers that the vehicle has been stolen, he can contact the alarm receiving centre which then ascertains the position of the vehicle. Such
- 10 information can be transmitted to the owner or to the police to assist them in recovering the vehicle.

It is also known for alarm systems activated upon detection of an alarm condition

automatically to place a telephone call to a predetermined number. However,

- 15 such systems are relatively inflexible and of limited utility.

There has now been devised a mobile-telephone based portable alarm unit which overcomes or substantially mitigates the above-mentioned or other disadvantages of the prior art.

- 20 According to a first aspect of the invention, there is provided a portable alarm and cellular telephone unit, comprising a cellular telephone transmitter/receiver, telephone number input means, a microphone and loudspeaker, wherein the unit further comprises a sensor adapted to detect an alarm condition, the sensor
- 25 being operably linked to the transmitter/receiver such that upon detection of the alarm condition an alarm call is placed automatically to a predetermined destination telephone number.

- 30 The unit according to the invention is advantageous primarily in that it is flexible in application. The unit may be used in the manner of a conventional mobile telephone, whilst also being of utility as an alarm unit adapted to alert its owner in the event of, for instance, a vehicle in which the unit is placed being broken into

or stolen, or a room in which the unit is placed being entered by an intruder, or an item of luggage in which the unit is held being moved.

Preferably, the unit according to the invention is housed in a casing of similar size

- 5 and dimensions to a conventional mobile telephone. This enables the unit to be carried comfortably in a pocket or in a handbag in a similar manner to a mobile telephone. The unit preferably has a similar general appearance to a conventional mobile telephone, with a microphone and loudspeaker disposed in a similar arrangement to that conventionally used in such cellular telephones and a
- 10 numerical keypad functioning as the telephone number input means. The unit is also preferably provided with a visual display screen which, in addition to functioning in the same manner as the display screen of a conventional cellular telephone, will also display status information regarding the alarm functions of the unit.

15

The unit is generally and most conveniently battery-powered. The battery is preferably a rechargeable battery, being recharged using any suitable charging device or solar power.

- 20 The sensor may have any of a number of forms. The sensor may, for instance, be a movement sensor, which is actuated in response to any movement of the unit. Other forms of sensor which may be used include voltage drop sensors, infra-red sensors, heat sensors, air movement sensors, etc. The unit may incorporate just one sensor or there may be more than one type of sensor, all of
- 25 which or a selected one or more of which may be armed at any one time, to suit the way in which the unit is being used at any particular time.

- 30 As well as one or more sensors built into the unit, the unit may be connectable to external sensors, eg sensors forming part of a conventional vehicle or domestic security system.

The unit preferably incorporates means for arming of the sensor (or a selected one or more of several sensors). Such means may comprise a manually

- operated switch, which may require a key or similar means to prevent accidental or unauthorised switching on or off. Alternatively, the sensor may be armed by entering a predetermined code via the keypad or other input device.
- 5 Another, and particularly preferred, method of arming the sensor is by dialling-in to the unit from another telephone. This may be particularly convenient where the user of the device has a separate mobile telephone. By dialling-in to the unit it may be instantaneously armed. This is in contrast to the arming methods described above in which there is necessarily a delay between arming of the
- 10 sensor and it becoming operational. In addition, the unit may be armed from a remote location. Where this method is used, the unit preferably preprogrammed to accept an arming call only from a specified telephone numbers, eg the user's mobile telephone.
- 15 According to another aspect of the invention, there is provided a portable alarm unit comprising a cellular telephone receiver/transmitter and a sensor adapted to detect an alarm condition, the sensor being operably linked to the transmitter/receiver such that upon detection of the alarm condition an alarm call is placed automatically to a predetermined destination telephone number, and
- 20 wherein the sensor is alternately armed and disarmed by reception of an incoming telephone call.

As mentioned above, the arming/disarming call is preferably from a preprogrammed, specified telephone number. In other words, it is preferably not possible for the unit to be armed or disarmed by any telephone other than the preprogrammed telephone.

The unit according to the second aspect of the invention may have all the features of the first aspect of the invention. However, the second aspect of the invention may also be applied to a unit which serves only as a portable alarm unit, and is not in itself useable as a mobile telephone.

The alarm call issued by the unit according to the invention in the event that the alarm condition is detected may be a call to another telephone, which may be a fixed landline or another mobile telephone. The call may transmit a prerecorded voice message or a text message. The call may alternatively (or in addition) be

5 to a predetermined e-mail address. As used herein, the term "destination telephone number" encompasses these and all other types of receiver to which a message may be transmitted via a cellular telephone network. The call may be transmitted, either simultaneously or sequentially, to more than one destination telephone number.

10

As well as the automatic issuance of the alarm call to the destination telephone number, the unit according to the invention may act as a local alarm by emitting an audible or visual alarm signal. Such an alarm signal may be generated upon detecting the alarm condition, in the same way that the alarm call is generated.

15 Such an audible signal may be, for instance, a siren or buzzer. A visual signal may be a flashing light. Though the emission of such signals may be desirable in certain applications, in many instances it may be undesirable. Where the unit is placed in a vehicle, for example, if such a signal is emitted it may alert a thief to the presence of the unit whereas it may be preferable for the unit to remain

20 undetected, particularly if the unit is capable of transmitting positional information that might assist in recovery of the vehicle.

Alternatively, or in addition, the unit according to the invention may also incorporate a facility for manually triggering an immediate local audible and/or

25 visual alarm. To achieve this, a manually operable button may be provided on the device which, when depressed, causes an immediate local alarm to be emitted and preferably also transmission of the alarm call as described above.

The unit may thus be used in the manner of a conventional "panic alarm".

30 The unit according to the invention may further comprise positional functionality, eg by the incorporation of a Global Positioning System (GPS) signal receiver. Such a unit may operate by receiving signals from two or more GPS satellites in orbit above the Earth. The unit may also include a paging responder which

operates in response to a paging request to transmit positional information derived from the GPS signals. The paging request may originate from the owner of the unit, following an alarm signal transmitted to the owner as described above, or may originate from an alarm receiving centre as for conventional vehicle tracking systems. Preferably, however, the positional information is transmitted automatically as part of the alarm call, rather than in response to a paging request, and may be repeated automatically at intervals thereafter.

Where the unit incorporates GPS functionality it may also have utility as a personal GPS system, providing information on its instantaneous position to its carrier (or to a third party).

The unit according to the invention may further be operably linked to circuitry effective to, for instance, immobilise a vehicle in which the unit is located. Such a connection may be directly from the unit to the vehicle circuitry or may be indirect, immobilisation being in response to a paging request issued by a destination telephone number at which the alarm call is received.

The invention will now be described in greater detail, by way of illustration only, with reference to the accompanying drawings, in which

Figure 1 is a schematic perspective view of a combined mobile telephone and alarm unit according to the invention;

Figure 2 is a schematic illustration of the manner in which the unit can be used to prevent the theft of a briefcase; and

Figure 3 is a schematic illustration of the manner in which the unit can be used to track the movement of a stolen vehicle.

30

Referring first to Figure 1, a combined mobile telephone and alarm unit according to the invention is generally designated 1. The unit 1 is similar in external appearance and dimensions to a conventional mobile telephone, though in order

to accommodate the additional circuitry necessary to provide the functionality required by the invention the overall size and weight of the unit 1 may be somewhat greater than those of a mobile telephone with otherwise similar capabilities.

5

Like a conventional telephone, the unit 1 has a numerical keypad 2 for the input of a telephone number or other numerical information. A display screen 3 is provided for the display of information such as a dialled or incoming telephone number, battery status information etc. A loudspeaker is housed behind a grille 4 near one end of the unit and a microphone 5 is located near the other end, in conventional fashion. Other conventional controls, such as a power on/off switch 6 are also provided.

10 The unit 1 is further provided with at least one sensor, which in the embodiment illustrated is a movement sensor housed entirely within the unit 1. Other forms of sensor which may be used include voltage drop sensors, infra-red sensors, heat sensors, air movement sensors, etc.

15 One example of the way in which the unit 1 may be used is illustrated in Figure 2. In this example, the unit 1 is placed in a briefcase 20 which has been left unattended (Figure 2a). Prior to the owner leaving the briefcase 20, he enters a pre-programmed activation code (eg a four digit number) into the unit 1 via the keypad 2. This code arms the movement sensor so that any movement of the unit causes it to transmit an alarm call to a telephone number that has been 20 programmed. In practice, there is a delay between entry of the activation code and arming of the sensor, to permit time for the user to position the unit 1 within the briefcase 2. Similarly, there is preferably a delay between movement of the unit 1 being detected and transmission of the alarm call, to permit the sensor to be disarmed by its owner on collecting the briefcase 2, by input of the 25 same or a different preprogrammed code number. Thus, prior to leaving his briefcase, the user switches the unit 1 on (if it is not already on) and enters the preprogrammed activation code. He then places the unit 1 in the briefcase 20 and closes (and possibly locks) the briefcase 20. To permit this to be done

- without triggering the alarm call, the delay between entry of the activation code and arming of the movement sensor may be, say, ten seconds or so. After this delay period has elapsed, however, any movement of the briefcase 20 (and hence of the unit 1) will cause the alarm call to be transmitted via the cellular telephone network (represented by the mast 21) to the preprogrammed number which, in the example illustrated, may be another mobile telephone 22 carried by the owner of the unit 1. The owner is thus alerted to unauthorised movement of the briefcase 20.
- 5
- 10 If the briefcase 20 is not interfered with, when the owner returns he can open the briefcase 20, remove the unit 1 and disarm it by entry of the appropriate code. Provided that this operation is completed within the permitted preprogrammed delay period the alarm is not triggered and the alarm call is not transmitted.
- 15 In a preferred embodiment, however, the sensor is armed by dialling-in to the unit 1 using the owner's mobile telephone 22. The number of the mobile telephone 22 is preprogrammed into the unit 1 which recognizes the incoming call and responds by arming the sensor. The advantage of this method of arming the sensor is that it is instantaneous. Likewise, the sensor may be disarmed by 20 dialling-in from the mobile telephone 22.

A similar mode of operation is illustrated in Figure 3, in this instance in relation to the security of a car 30. The unit 1 is in this case hidden in the car 30, eg under a seat or in a glove compartment. Again, prior to the owner leaving the car 30, he 25 places the unit 1 in its concealed position, and then arms it by dialling-in from his mobile telephone 22. If the car is then stolen the unit 1 is activated and the alarm call is transmitted via the cellular telephone network 21. In the illustrated example, the alarm call is placed to the mobile telephone 22 carried by the vehicle owner.

30

In this form of application it may also be beneficial for the unit 1 to be fitted with global positioning system (GPS) functionality so that the unit can transmit information on its instantaneous location. Such positional information is obtained

from overhead satellites 33 in a manner which is known *per se*, and is transmitted as part of the alarm call.

Claims

1. A portable alarm and cellular telephone unit, comprising a cellular telephone transmitter/receiver, telephone number input means, a microphone and loudspeaker, wherein the unit further comprises a sensor adapted to detect an alarm condition, the sensor being operably linked to the transmitter/receiver such that upon detection of the alarm condition an alarm call is placed automatically to a predetermined destination telephone number.
- 10 2. A unit as claimed in Claim 1, wherein said telephone number input means comprises a numerical keypad.
- 15 3. A unit as claimed in Claim 1 or Claim 2, wherein the unit is further provided with a visual display screen.
4. A unit as claimed in any preceding claim, wherein the sensor is a movement sensor, which is actuated in response to any movement of the unit.
- 20 5. A unit as claimed in any preceding claim, which is connectable to one or more external sensors.
6. A unit as claimed in any preceding claim, further comprising means for arming of the sensor or a selected one or more of several sensors.
- 25 7. A unit as claimed in Claim 6, wherein said means comprise a manually operated switch.
8. A unit as claimed in Claim 6, wherein said means comprises means for entering a predetermined code via the telephone number input means.
- 30 9. A unit as claimed in Claim 6, wherein the sensor is armed by dialling-in to the unit from a remote telephone.

10. A unit as claimed in Claim 9, which is preprogrammed with the number of the remote telephone by which the sensor is to be armed.

11. A portable alarm unit comprising a cellular telephone receiver/transmitter

5 and a sensor adapted to detect an alarm condition, the sensor being operably linked to the transmitter/receiver such that upon detection of the alarm condition an alarm call is placed automatically to a predetermined destination telephone number, and wherein the sensor is alternately armed and disarmed by reception of an incoming telephone call.

10

12. A unit as claimed in any preceding claim, further comprising means for issuing a local audible or visual alarm signal upon detection of the alarm condition.

15

13. A unit as claimed in any preceding claim, further comprising manually actuatable means for issuing a local audible or visual alarm signal.

20

14. A unit as claimed in any preceding claim, further comprising a Global Positioning System (GPS) signal receiver adapted to receive GPS signals from two or more GPS satellites in orbit above the Earth, and adapted to transmit positional information derived from the GPS signals.

1/2

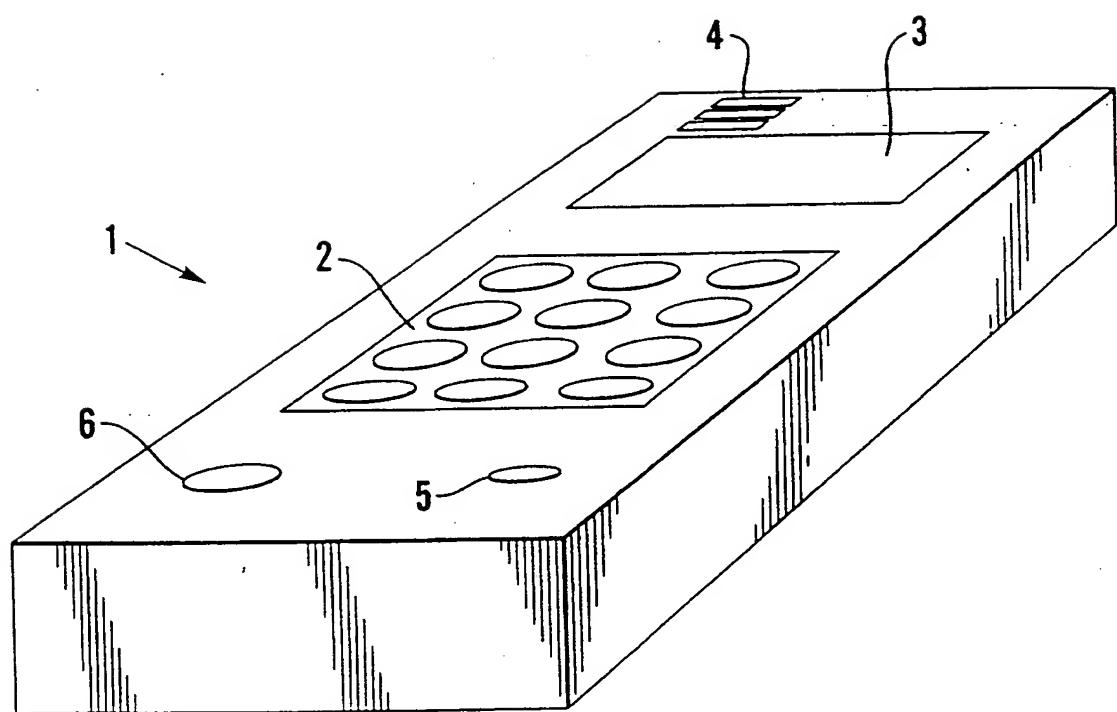


Fig. 1

2/2

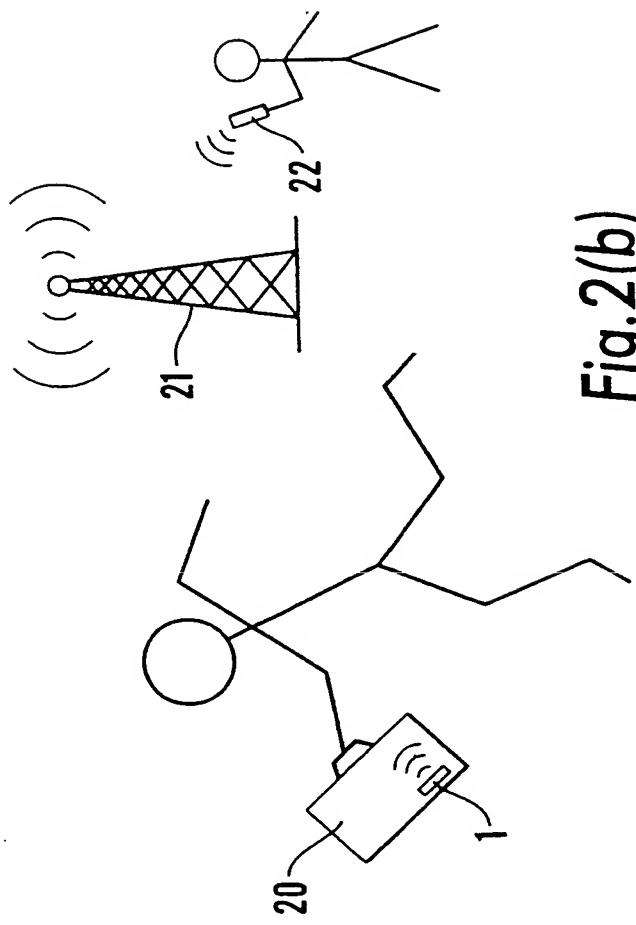


Fig. 2(b)

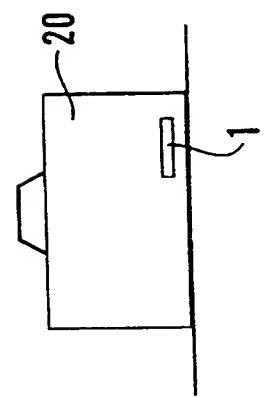


Fig. 2(a)

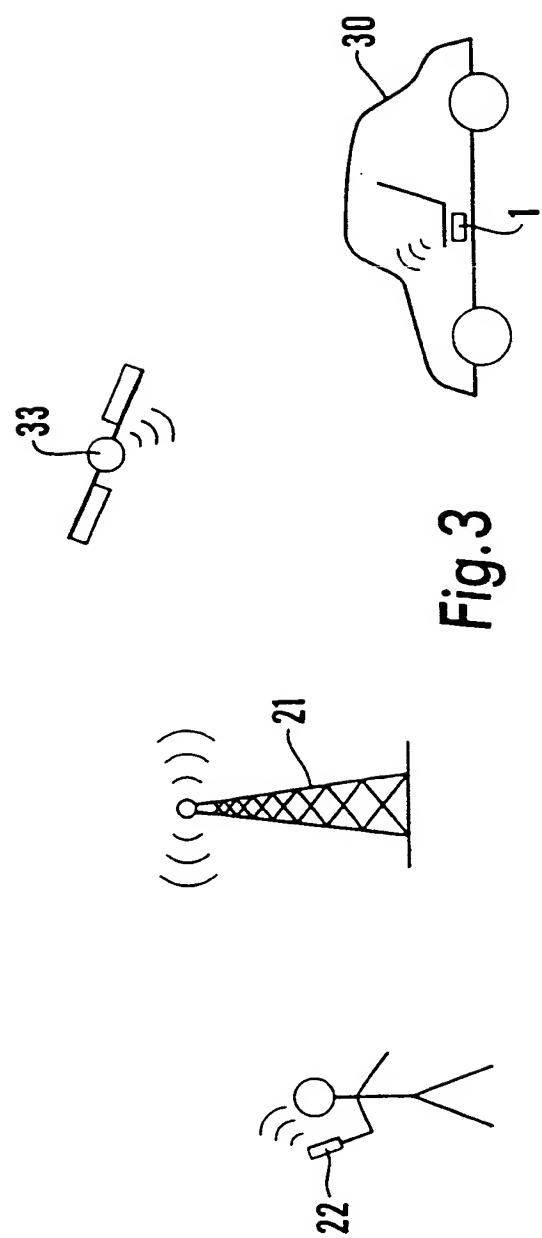


Fig. 3

INTERNATIONAL SEARCH REPORT

Internal Application No

PCT/GB 00/03617

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 H04M1/725 H04M1/66 H04M11/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 742 666 A (ALPERT) 21 April 1998 (1998-04-21) abstract column 3, line 6 - line 14 column 3, line 34 - line 50 column 4, line 35 - line 65 column 5, line 8 - line 23 column 5, line 55 -column 6, line 14 column 6, line 28 - line 38 column 6, line 59 -column 7, line 8 column 13, line 51 - line 65 column 14, line 35 - line 48 figures 1,2,3A,8 ----- -/-	1-5,7,14
A	column 3, line 6 - line 14 column 3, line 34 - line 50 column 4, line 35 - line 65 column 5, line 8 - line 23 column 5, line 55 -column 6, line 14 column 6, line 28 - line 38 column 6, line 59 -column 7, line 8 column 13, line 51 - line 65 column 14, line 35 - line 48 figures 1,2,3A,8 ----- -/-	11

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

^o Special categories of cited documents :

- ^{*A*} document defining the general state of the art which is not considered to be of particular relevance
- ^{*E*} earlier document but published on or after the international filing date
- ^{*L*} document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- ^{*O*} document referring to an oral disclosure, use, exhibition or other means
- ^{*P*} document published prior to the international filing date but later than the priority date claimed

^{*T*} later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

^{*X*} document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

^{*Y*} document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

^{*&*} document member of the same patent family

Date of the actual completion of the international search

19 February 2001

Date of mailing of the international search report

01/03/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Fragua, M

INTERNATIONAL SEARCH REPORT

Internat. Application No

PCT/GB 00/03617

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 44 21 508 A (BUREN) 1 December 1994 (1994-12-01) column 1, line 34 - line 61	1-5,7,14
A	column 2, line 10 - line 20 column 2, line 48 -column 3, line 4 column 6, line 53 -column 7, line 12 column 7, line 35 -column 8, line 4 column 9, line 47 -column 10, line 19 column 10, line 46 -column 11, line 4 figures 1,2,4 ----	11
X	DE 196 52 142 A (SCHMIDT) 18 June 1998 (1998-06-18) abstract	1,2,4,5, 7,14
A	column 1, line 26 -column 2, line 9 column 2, line 31 - line 36 column 3, line 8 - line 14 column 3, line 32 - line 59 claims 12-14,21 figure 1 ----	11
X	EP 0 920 225 A (MATSUSHITA ELECTRIC IND CO LTD) 2 June 1999 (1999-06-02)	1,5,7
A	column 1, line 45 -column 2, line 24 column 2, line 33 -column 3, line 5 column 3, line 44 - line 56 column 4, line 50 -column 5, line 33 column 6, line 7 - line 43 figures 1,2,4 ----	2,3, 11-13
A	WO 97 36771 A (NEXUS TELECOMM SYST) 9 October 1997 (1997-10-09) abstract page 5, line 5 -page 6, line 20 page 7, line 23 - line 29 page 8, line 15 -page 9, line 4 page 9, line 11 - line 24 figures 1,2 ----	1,6,9, 11,14

BEST AVAILABLE COPY

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internat. Application No

PCT/GB 00/03617

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
US 5742666	A 21-04-1998	NONE		
DE 4421508	A 01-12-1994	AU 7067394 A		17-01-1995
		WO 9500860 A		05-01-1995
		EP 0739491 A		30-10-1996
DE 19652142	A 18-06-1998	NONE		
EP 0920225	A 02-06-1999	JP 11164057 A		18-06-1999
		CN 1218360 A		02-06-1999
WO 9736771	A 09-10-1997	AU 1937097 A		22-10-1997

BESI AVAILABLE COPY

THIS PAGE BLANK (USPTO)